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Coin World editors noted in 1963: Gary Beals, already at age 19 a recognized numismatist on the West Coast, authored this article especially for Coin World readers to provide a lucid explanation of the law and its application to our hobby in easy to follow narrative style. Beals notes that he is indebted to Maurice Weekly, editor of *Intercoin* and Dr. George Babilot, professor of economics at San Diego State College [now University] for their editing of the manuscript before submission to Coin World.

Author's 2017 note: Interesting to note that this article was printed in Coin World on 1 November, 1963, almost a year before .900 fine coins stopped being produced for circulation in the USA. With fits and starts, the USA moved from silver coinage into fiat currency beginning in 1965.

In 1963 as a college kid, I never dreamed Gresham's Law would happen again in the USA — but it has, twice. This is a greatly up-dated version of that article, which explores the end of silver coins in 1964 and the end of bronze cents in 1982 — incidents that are still with us 17 years into a new century. The odd thing is that I wrote about Gresham's Law in 1963 certain that it had nothing to do with the modern USA. And in this update on the subject 54 years later I started with the belief that I was only working on history. But today there are dealers on the Internet selling bags of pre-1982 cents to hoarders who stash them away, somewhere. And today there are still not-quite coin collectors who buy \$1000 bags of dimes at banks so they can extract perhaps eight or ten 90% silver coins worth \$1.20 apiece from the 10,000 in the bag.

The verbs of the 1963 article have been shifted from the present and future tenses to past tense to make more sense to today's readers. Little thought was given to Gresham's Law occurring again in the USA within months of when this article was written in 1963 simply because the silver value of our coins had not increased dramatically up to that point.

Beals published the 354-page Spanish-English numismatic dictionary *Numiscadero* late last year as a guide for collectors in both the Hispanic and the English-speaking countries. He and his wife Maureen moved to Segovia, Spain from San Diego, California in 2004. He welcomes contact from fellow numismatists at: segovia.gary@yahoo.com

Bad money drives good money away — Revoking this monetary law is like repealing gravity

By Gary Beals San Diego, California November, 1963 • Segovia, Spain July 2017

Simply stated, Gresham's Law is the axiom that bad money drives good money out of circulation when a country attempts to circulate both at the same time. This theory, which is often so important to numismatics, is often misunderstood. Gresham's law says that when both good and bad coins are both required to be legal tender, the inferior money remains in circulation while the good money gets hoarded or exported. Examples of bad money could be counterfeit notes, gold or silver coins that had their edges clipped to steal metal, or when two forms of money are in use and one is intrinsically superior such as a gold coin vs. a banknote of the same face value.

Anyone younger than about 60 might have no personal memory of Gresham's Law occurring with silver coins. The oldest collectors among us will remember the years when bags of dimes and quarters were first being sold for their silver value. Younger collectors may have enjoyed finding the occasional .900 fine dime or quarter in their change in the 1970s and 1980s. Gresham's Law is partly the cause of the disappearance of half dollar coins in circulation since 1964 as well.

This article is not a detailed study of an obscure aspect of numismatics. Gresham's Law has affected money for centuries. This article is presented to those numismatists interested in how coins effect people as well as how people effect coins. The things people do because of coins and currency are often as intriguing as the designs, histories and values of the money itself. So this law has its place even today in the boundless world of numismatics.

To most people, the study of economics is neither exciting nor simple, but at least one law of economics is interesting to collectors because of its link to coins. Gresham's Law, in simple terms, states that there is a natural tendency for bad or debased money to force good money out of circulation. This law almost invariable becomes an important factor during a national emergency or other time of economic stress.

Gresham's Law is still enforcing itself in the USA

Gresham's Law is still driving actions about certain U.S. coins right now — but perhaps it is a bit silly. Is it still Gresham's Law if only a tiny fraction of a country's citizens are the ones pulling what's left of the 'good' coins from circulation? That seems to be the case with the last of the 95% copper Lincoln cents.

This article will track Gresham's Law back in time from the current bags of coins business in the U.S. to some major impacts on different nations' economies. We will end up at the pre-coin cultures of some 3,000 years ago.

A 2017 prologue

Gresham's Law occurred only twice in modern USA — both since my original Coin World article was written in 1963 — and it will never happen again. In mid-1982 the U.S. stopped producing bronze cents and switched to copper-plated zinc. This caused the 'bad' zinc coins to circulate while the 95% copper cents began disappearing. But 1965 was the huge milestone in human history — and a fundamental change in the way people around the world thought about silver coins. For some 2,600 years of coins'

existence, metal value and face value had a close relationship. For as long as there have been coins, the value of the metal in the coins provided told users that the gold, silver and even copper and bronze in their coins was a form of insurance. Centuries ago, the intrinsic value, or the precious metal value in a coin, was vital assurance in an uncertain world. It mattered both where the coin was made and its weight and metal value was.

Americans, thanks to the stable .900 silver in their coins since 1837, saw Gresham's Law as just a concept, something that happened elsewhere to other people. When it happened to us it was a multi-year, undramatic reaction to the end of silver in coins beginning in 1965. The minor hoarding silver coins in the years before that was amateur speculation on silver values, not Gresham's Law at work. How do you tell speculating from Gresham's Law? Ask: What coins are being used in place of the ones hoarded? If there is no 'bad' coin or banknote involved, it is simply speculation.

This obscure monetary concept completely changed the way both numismatists and poorly informed collectors look at 'coins' today. Without Gresham's Law the world's mints would not now be producing both copper-nickel and zinc circulating coins as well as over-priced, pure silver 'collectable commemorative' non-circulating legal tender (NTLC) pieces. In addition there are the hundreds of types of bullion silver rounds and small ingots produced by both public and private mints since the 1970s that owe their existence to Gresham's Law.

The last glimmer of Gresham's Law in the USA: The bronze cents disappear

While my 1963 article had no example of Gresham's Law dealing with U.S. coins later than the Civil War, this update begins with the two instances that occurred since 1963 and still have an effect on circulating coinage today. Inflation is the other player here — and more about that will follow. In countries where inflation is high, the metal value in coins keeps rising. In the U.S. where inflation is low, we rarely face a need to change minor coin composition — but we are facing it now as many Americans attempt to stop minting cents. Older readers may remember Dime Stores. Today they have been replaced by Dollar Stores.

The last example Gresham's Law in the USA began, officially, in mid-1982 when bronze — the noble metal in cents since 1857 — was replaced by copper plated zinc. While at that point the copper in the penny was well under a cent in value, it was easy enough for people to hoard the pre-1982 cent. Did bad zinc pennies drive good 95% copper pennies out of circulation? Yes, but perhaps one cent coins drive themselves out of circulation simply because they are a useless nuisance to many of us. Thousands easily end up in piggy banks, dresser drawers, car ashtrays, button boxes and others stashes.

The cent began as a thick, all-copper coin in 1793 – first 29 mm in diameter, and reduced to 27.5 mm in 1835. (A modern half dollar is 30.6 mm in diameter.) This large cent ended in 1857 because of the increased cost of copper, minting and distribution of the unpopular big coins. The new, smaller copper-nickel coins with the flying eagle and then the Indian head were successful. Beginning in 1864 the cent was made of bronze — 95% copper with some combination of tin and zinc as well. This 95% copper alloy remained until mid-1982, undisturbed except for the steel cents of 1943.

Then came the zinc version. Zinc is an awful metal for coinage, one that signals clearly: "Do we really need a coin this cheap in our commerce?" Zinc is a grey metal that is the material of choice when a government looks to make a near-valueless coin. Worldwide, the thought of not making a coin so useless does not seem to enter leaders' minds. Zinc coins are the Kardashian sisters of monetary systems. They are flashy at the first glance, but there is no substance under the shiny surface. Why should we still have a cent coin when the USA gave up the copper half-cent in 1836, the copper large

cent in 1857, and the bronze cent in 1982? The denomination of cent is just too small to buy anything in the 21st century.

Copper's modestly changing value over the last 35 years shows this final U.S. Gresham's Law incident to be more emotional than financial. Gresham's Law is driven by the *perception* of a difference in value between the two coins. The bronze cent today has almost 1.8 cents worth of copper in it based on current spot copper prices, but is still not a good investment. There would be no profit in illegally melting them down. Copper hit a high of nearly \$1.50 a pound in 1979, but when it was removed from coins in mid-1982 it was only about 50 cents a pound. In 1986 copper rose again for a few years to about \$1.50 a pound. It remained above \$1 a pound from about 1990 to 1997 and then it dropped below \$1 a pound. However, in 2003 copper's value soared beyond \$4 a pound and mostly stayed in that range until 2012 when it dropped down to about \$2.50 a pound, where it is today.

There is one pound of copper in 154 bronze pre-1982 cents. In 1974 copper reached a record \$1.40 per pound — for \$1.54 worth of cents. Making zinc pennies was first considered back then, but abandoned as copper's price dropped well below the cent's melting point. When copper hit \$1.44 a pound in early 1981 the zinc cent program came to life again. When the zinc cents first appeared in mid-1982 the government expected them to circulate side-by-side with the bronze Lincoln cents. This was a miscalculation that overlooked Gresham's Law just as happened in 1965 with silver coins.

The government made it illegal to melt down coins — the rumor was a \$10,000 fine, imprisonment of up to five years, or both. But there is no law against having them. "The coins in your possession are your property," explained Dick Johnson, the original editor of Coin World newspaper. "You can do with them what you wish — toss them in glass jars, lay them on railroad tracks for trains to run over, run them through elongating machines, engrave hobos on the reverse, even counterstamp them with letters or your name. Or you can spend them. That is where the government has control — it controls coins in commerce."

In 2006 some firms investigated legally smelting pre-1982 cents, sensing that the government has little interest in using law enforcement to nab cent smelters. While against the law, melting pennies was and is impractical and unprofitable. So what we have is hobby speculators hoarding cents and waiting to see if laws are repealed or copper value shoots up dramatically.

There is still an odd market for copper pennies today at about a cent and a half each. The actual copper value in a cent is about 1.8 cents. Copper today is worth about \$2.68 a pound. A coin sorting machine dealer said: "Most people saving copper pennies are keeping them not for the short term but for the mid- to long-term." Whatever the long term is for copper cents, it has not arrived so far. Said one starry-eyed speculator: "Hoarding copper pennies is really not a bad investment. The penny will always be worth a penny so no matter what happens to the price of copper you can always get your initial investment back. The upside is a commodities play on copper."

The rocky logic of hoarding pre-1982 the cents is: Copper is an useful metal with properties which make it difficult to replace. Copper can be cast and formed, it conducts electricity well, doesn't corrode easily and has anti-fungal and anti-bacterial properties. There have been no major new finds by copper miners so it could get even more valuable.

Another Internet dealer offers 1000 'Wheat' cents dated from 1940 to 1958 for \$39, and 1000 pennies minted between 1910 and 1919 for \$259. Indian head cents in bags of 5,000 cost \$6,450. Given the lack of growth in the value of copper, this is an obsessive compulsive disorder (OCD) beyond any rational kind of collecting. The merchant's website offer on these bags: "Our bulk cents are a great way

for the penny collector to have more than he could ever handle. We offer interesting bag lots sorted by date. A question we get asked frequently is: ‘Are the rare dates in there?’ The answer should be no, but who knows, we could have made a mistake.”

What is going on today with overlooked silver dimes and quarters and the hoarded bronze cents is not numismatic, but it is interesting. The inventory in 2x2 holders and plastic flips owned by thousands of coin shops and vest-pocket dealers in the USA is enough to support the needs of new collectors for another century. Bags of 95% copper Lincoln cents from the 1940s graded good to very good will not be needed in Whitman or Dansco coin albums in anyone’s lifetime.

If there is a satiety reflex for buying bulk copper coins it appears not to work for some hoarders. Participants in those frequent and strange American hot dog eating contests practice eating larger and larger amounts of food to overcome the satiety reflex so the stomach can accept a huge amount of food. Don’t we have something similar with people on far fringes of numismatics who buy bags of copper cents and stuff their garages with them?

A web dealer makes this offer to hoarders: “We have massive collections of bulk Wheat Penny Bags, bulk 90% Junk Silver, bulk Jefferson Nickels, bulk Roosevelt Dimes, bulk Washington Quarters and bulk Foreign Silver Coins. Look for our famous Unsearched Wheat Bag Collections and Hoard Collections.” (How this firm can assure that bags of coins are “unsearched” is a mystery.) Included in one dealer’s offerings are “35 pound bags of wheat pennies for \$299.” The various titles used to romance these bags include Overland Kansas, Underground Atlanta, Miami Buyout, Fireman’s, Portland, Capt. Round Table, June Bug, Casper Connection, Cascade Iowa, and Bad Axe Box. The misleading implication is that these bronze cents came from some specific hoard or collection and thus have a greater importance or value than simply random bags of low grade cents.

Devices have been marketed that sort silver and copper coins from less valuable metals and these are being used clear into this century to pull pre-1982 cents and pre-1965 dimes and quarters from circulation. It is likely the Treasury Department itself used such machines, especially for extracting silver dimes and quarters from the copper-nickel versions after 1965. These coin sorting machines go by brand names such as Cassida, Nadex, CoinMate and Ryedale.

Silver’s last stand in the 1960s

In the 1960s few Americans gave much thought to the silver in their coins. The 90% silver in U.S. coins before 1965, was simply what dimes to dollars were made of. The silver metal value of a coin was about 75% of its face value, but that was seldom contemplated. People realized that U.S. coins were made of silver — you know, like nice jewelry. And we remember Mom and Dad getting that box of sterling flatware out of the closet for our Thanksgiving and Christmas dinners. So possessing silver coins provided people with a quiet sense of confidence and well-being.

The U.S. coinage system had its origins in medieval Europe. The government set standards for the amount of silver going into a coin. The amount of money needed was determined by the private sector. If more money was needed, silver was brought to the mint and struck into new coins. If less money was needed, coins in circulation were melted down and the silver was put to other uses. The price level in the country signaled the need to either mint or melt silver. If the silver in coins became too cheap money could be made turning coins into ingots. If silver was expensive, then it was profitable to sell bullion to the mints so more coins could be produced. These two actions regulated the price level over the centuries.

The intrinsic value in coins was a floor below which a coin's value would not fall and a face value ceiling just above it, beyond which it could not rise. When the metal value in a coin came close to the face value a government would change the alloy, using a less valuable metal, according to an *Economic Perspectives* article by Francois Velde.

In 1965 the USA the 125 years of pleasure and reassurance we enjoyed in always having .900 fine silver coins came to an end. Based upon the billions of 90% silver coins produced in 1964, there was no clue to what would happen beginning in 1965. More than two billion dimes (2,286,877,180 exactly), more than one billion quarters (1,264,526,113 exactly) and 429,509,450 half dollars were struck by our mints in Philadelphia and Denver. Thus in 1965 90% silver coins were supplemented with copper-nickel clad coins — and Gresham's Law was officially launched once again.

We had plenty of silver in the USA — until we didn't

In 1963 the Treasury officials were certain their stockpile of silver would last 20 years. But four times the silver coins were minted in 1964 than was expected. This was first thought to have been demand created by more vending machines. It turned out to be speculators hoping to see silver rise sharply in value. The Senate met on the subject but came to no conclusion — certainly no serious examination of Gresham's Law ever took place. The Treasury also studied the problem and in February 1965 recommended eliminating or greatly reducing silver in minor coins. This led to the Coinage Act of 1965.

Investors remained keenly interested in silver, gathering around 620.5 million ounces of silver from 1964 through 1970. The price of silver rose from \$1.29 to a peak of \$2.57 in 1968, before falling back. The rise and fall in silver prices was tied to the amount of investor buys. Once investor demand decreased during 1969 to 1971, silver prices came down. The weighted average price of the investor silver sales from 1971 through 1978 was \$3.21.

The goal of the government in 1965 was not to remove silver coins from use but to reduce its need to buy silver. But it had to keep silver below \$1.29 per ounce. To do this it sold silver from its vaults, reducing its supply from 1.2 billion ounces to 350 million ounces in two years. It also banned melting or exporting silver dimes and quarters. In July, 1967 it stopped selling fixed price silver.

Numismatic columnist Alan Herbert explained: "While President Johnson told the public that silver coins would continue to circulate with the new clad coins, the Treasury was secretly pulling silver coins from circulation. The last of the recovered coins were melted in 1969 at the New York Assay Office and the Denver mint." A number of rules changed because of Gresham's Law. The Treasury in 1965 was given authority to withdraw and melt all worn or non-current coins without needing to reuse the metal in coinage.

Comments by the president in July, 1965 show no understanding of Gresham's Law and were, basically, a lie: "If anybody has any idea of hoarding our silver coins, let me say this. Treasury has a lot of silver on hand and it can be and it will be used to keep the price of silver in line with its value in our present silver coin. There will be no profit in holding them out of circulation for the value of their silver content." Obviously, citizens hoarded all the silver coins they could find.

The 1965 switch to clad coinage was not a major shock to either the average citizen or the numismatist, because the value of silver did not suddenly increase. There also did not seem to have been a dramatic snatching of silver coins from circulation by people in 1965. Hoarding was going on, but it was not obvious or seen as a major fad. The mints were busy striking clad coins in 1965, 1966 and 1967 to

compensate for those disappearing silver coins. In those three years there were 5.3 billion clad dimes produced, and more than 4 billion quarters. The total number of silver clad half dollars did not reach a half billion during these three years, beginning a period of the disappearing Kennedy half dollars which continues to today. Gresham's Law indirectly created the disappearance of the 50 cent piece as pocket change.

Hoarding U.S. silver coins in the 1960s

Even by late 1966, only a few people were madly pulling silver coins out of circulation. Coin collecting as a hobby in the mid-1960s was about 10 times bigger than it was in the mid-1950s. The notion of investing in coins was big in the early 1960s — complete with Teletype systems for coin dealers. Many self-appointed experts gave seminars on what was called coin investment secrets.

By 1968, hoarding was in full swing. The low value of silver still did not make the hoarding seem worthwhile to many people. Even by the mid-1970s the silver content was only about 30% over face value of U.S. coins. People could still frequently find silver coins in circulation in the 1980s.

When would hoarders gather up silver coins from circulation? If you hoarded \$1000 in silver coins in 1950 — big mistake — you would have had to wait about 17 years for those 723 ounces of silver to be worth more than its metal value of \$918. Silver's price, controlled for decades by the U.S. government, did not rise above \$1.27 an ounce until 1968 when it hit about \$2.20 an ounce. That would have totaled \$1,584. But if you bought silver in 1964 you would only have needed to sit on that investment four years to make 50%. You could have bought silver coins in 1968 and held them until 1970 when silver was \$1.75 an ounce. Your 723 ounces in your \$1000 face value would have been worth \$1,260 — a modest gain. Even better, if you waited until 1975 to sell when silver hit \$4.50 an ounce, your \$1000 in coin silver would have been worth \$3,255.

What becomes clear here is that Gresham's Law and smart investing have little to do with each other. The first smart date to begin hoarding U.S. silver coins would have been in 1966, when silver was about \$1.30 an ounce.

The U.S. government took a lot of actions attempting to correct the effects of Gresham's Law, many which changed the nature of U.S. coins. Treasury executives believed, incorrectly, that clad coins containing silver were not as likely to be hoarded. To discourage the hoarding and collecting of U.S. coins based on mint marks, the mints stopped putting 'D' for Denver on coins from 1965 through 1968.

Gresham's Law stopped the existence of the 1964 Peace type silver dollar. Congress in August 1964, pushed by Montana Senator Mike Mansfield, passed an appropriation for striking 45 million silver dollars. The mint struck about 300,000 1964 dated peace dollars, but in May 1965, because of a huge public complaint that the coins would only be hoarded, they were all melted.

Background: The hidden hand of the U. S. Treasury controlled silver's value

From the end of World War II through the early 1960s the U.S. Treasury had a stockpile of silver bought decades before. It sold millions of ounces to keep silver's price below its monetary value. The Treasury's leaders knew that if silver's market value rose above its controlled monetary value of \$1.27 per ounce there would have been a strong incentive for people to melt down silver coins in circulation, according to the Silver Institute.

Somewhere in all this manipulation the quote by John Kenneth Galbraith applies: “The study of money, above all other fields in economics, is one in which complexity is used to disguise truth or to evade truth, not to reveal it.”

During the 1960s the Treasury sold more silver than it bought. In 1960 and 1961, the Treasury sold 85 million ounces of silver bullion, and used another 46 million ounces for coins. Another 56 million ounces was used to replace silver coins that had been taken out of circulation by hoarders and speculators — an early hint of Gresham’s Law. In 1961, the Treasury ordered \$5 and \$10 silver certificate banknotes out of circulation, which freed up silver reserves and reduced the public’s call on Treasury silver. In June 1963 the Treasury replaced the \$1 silver certificate with Federal Reserve notes. By 1963, silver prices reached \$1.29, the monetary value of silver in U.S. coinage.

In late 1963 the Treasury resumed its silver bullion sales. In the six years between 1960 and 1965, the Treasury sold 342 million ounces of silver bullion and used another 814 million ounces of silver for minting coins. In all, the Treasury used just over a billion ounces of its silver reserves. Much of this silver, especially in coins, was quickly bought up by speculators. The Treasury had to keep the silver market calm and well supplied until silver coins had been totally pulled from circulation. But investors presumed (incorrectly, as it turned out) that the price of silver would go up quickly and snatched millions of silver coins out of circulation.

Federal Reserve Banks: controlling the flow of U.S. coins and banknotes

Federal Reserve System, nicknamed "the Fed," is required to obtain coins from the mints and distribute them to member banks as needed. The Fed also picked up coins the banks did not need, a process called "flowback." The Fed processed and cleaned these coins, and then shipped them to banks needing them. Only about 20% of the coins the Fed handled were uncirculated ones from the mints. There was a seasonal need for coins, based on local preferences.

In early 1963, when few coins were returned, some officials blamed coin collectors, speculators and coins held in millions of vending machines. The mints began around-the-clock shifts to increase production. A new Philadelphia Mint was authorized in 1963, but did not open until 1969.

In spite of massive production by the mints, 1963 and early 1964 had weak coin flowback. The Fed found that banks and businesses feared more shortages and were keeping coins. More and more of the silver coins were being taken from circulation by people believing the price of silver would rise. The coin shortage continued putting stores of all sizes under great pressure.

The Treasury began removing silver certificates from circulation, replacing them with regular banknotes. This helped free up silver it held as backing for the certificates. The Treasury redeemed certificates with silver bullion instead of silver dollars after March, 1964. The stock of 272,000,000 silver dollars it had since 1954 was vanishing fast. People showed up at the Treasury Building in Washington, with wheelbarrows, personal security guards and armored cars to haul away the silver. Citizens could take up to 50,000 in a day, and paying in silver certificates was not required. The remaining 2,970,928 silver dollars in May, 1965 had a high numismatic value. In 1970 Congress approved their sale at a premium.

The Coinage Act of 1965, passed on July 23: Goodbye, silver

In 1965 the U.S. government finally took action to eliminate silver from the circulating U.S. coins. There had been coin shortages as early as 1959, and the mints expanded production to try to meet

demand. In the early 1960s more silver was being used for both coins and industry. This put pressure on silver's value, which the government sales capped at \$1.29 per ounce. At this point, the silver in 10 dimes or four quarters would be worth more than \$1 face value if the price rose past \$1.38 per ounce.

By May 1965 the government's supply of silver was being rapidly sold and it could have run out by 1968. In June 1965 President Lyndon Johnson recommended that Congress pass legislation to produce silver-less dimes and quarters and 40% silver half dollars. There was some opposition from Congress members representing the Western silver mining states, but the bill passed on July 23, 1965. The new coins began to enter circulation in late 1965, and reduced most shortages. They circulated with the silver coins for several months, but as the Treasury ended its efforts to keep silver prices low the silver coins were widely hoarded by early 1967.

The worldwide use of silver more than doubled from 1958 to 1965, but mining increased by only about 15 percent. Industrial uses for silver included photographic film, batteries, and electronic components. The Mint's striking of silver coins increased in an attempt to meet demand. It used 111.5 million troy ounces of silver in coinage in 1963, up from just over 38 million in 1958.

In spite of the increased demand, silver prices were held in place because the Treasury would redeem silver certificates at \$1.29 per ounce. Without the government as the supplier of last resort, silver's price would rise, making it profitable to melt both silver dollars and minor silver coins.

In 1963, the gap between production and consumption in the non-communist world was 209 million ounces. A slight rise in the price of silver might not have caused a major production boost, as silver was mostly obtained as a by-product in the mining of copper and lead. Many speculators joined the fray in July 1967, after the Treasury announced that it would no longer maintain silver at the \$1.27 price. It was clear at that point to both citizens and government that the remaining silver coins would vanish from circulation — and they did. When silver certificate redemptions ended in June, 1968, the price of silver had risen to \$2.56 per ounce.

Values then and now: A reminder about inflation and the ever-weakening dollar

A 2% inflation rate and the dollar's weakening over the last 50 years are unrelated to Gresham's Law and can confuse the discussion about our money in 1965: While it is strange now to think of silver being worth less than a dollar per troy ounce (31.1 grams) we need to consider what an inflation-adjusted dollar would buy back in 1964 and 1965. Something that cost a dollar then now costs about \$8. More specifically, the government's silver price of \$1.29 per ounce would be \$10.32 now. Gas was about 31 cents a gallon, a loaf of bread cost 21 cents, a new house cost \$14,000, the average new car cost \$2,700 and the average income was \$6,500 a year. And the typical late 1700s Spanish-American 8 *reales* coin in a coin shop was about \$5.

We can look back at 1965 culturally as well: The war in Vietnam continued to worsen and the anti-war movement grew. There was rioting, looting and arson in Los Angeles. This was the first year health warnings appeared on cigarette packs. The latest craze for kids was the skateboard. Men's hair grew longer and the mini-skirt appeared. The Beatles released four new albums. President Kennedy was assassinated in November, 1963 and in early 1964 a new half dollar to honor him created worldwide attention. Some of the first coins released sold in the frenzy for \$5 each.

Searching for silver in rolls and bags of coins: A curious hobby that continues even now

Even in recent years the Internet hobby help sites are filled with advice threads, both sound and flaky. One writer claimed: “Anytime a bank gets a pre-1964 silver coin, they are to remove it from circulation and return it to its Federal Reserve Bank for further return to the nearest U.S. mint for melting. The same goes for 1943 steel pennies and 1942-45 silver nickels.” Another person said the opposite: “It's not economical for banks to pull silver coins from circulation. I have found rolls of silver coins — it's usually in the customer paper rolls. Most machine coin counters reject silver coins. The Treasury doesn't fool with it either or melt them.

A third writer who claims to have worked in banking / financial services opined: “Most banks have no set policies in place or if they do it occurs so infrequently that staff forget what they're supposed to do and they wind up being put back in circulation. I got a pre-1965 quarter in change about a year ago. Banks handle so much coinage that they can't be bothered to take time to set coins aside for return to the Federal Reserve in the rare occurrence they get one. Silver coinage phased out so long ago (50+ years) that most tellers probably don't even know there's such a thing as silver coins.

In 2012 someone asked “Does anyone know if coin processors (Brink's, Loomis, etc.) sort out silver and older coins? I heard a rumor that some so you will rarely find any in their rolls. Does anyone know if there is truth to this rumor?” One answer: “They all do – this hobby is not worth the time.” Yet another person answered: “None of the couriers are pulling silver. This rumor has been circulating a couple of years. Not happening. They make way too much money delivering currency. And another said: the couriers do cull silver out of the system. There is absolutely no point in ordering coin from banks and searching for silver. Roll searchers like to report their results. Said one; “In my last 20 boxes (20,000 coins) I found only one silver half dollar. The fall-off is amazing.”

This writer contacted the CoinStar company regarding their machines in high-traffic areas used to turn change into cash. A representative said that in fairness to customers silver coins (along with foreign coinage) are sorted out of change kicked back into a return bin by the machines.

Mexico in the 20th century was a repeated case study in Gresham's Law

It was common for countries to debase the metal content of a new coin issue because of inflation or political graft. Mexico had many brushes with this monetary reaction in the 20th century. As demonstrated countless times throughout history, citizens used the newer coins and the older issue — having the greater metal value — will disappear from circulation.

Since colonial times the enormous quantity of silver mined in Mexico allowed for stable *reales* and *peso* minting at .902 fineness or higher. In 1900, the Mexican peso was a coin slightly larger than the U.S. silver dollar. The first twinge of Gresham's came along in 1905 when a peso of .800 fineness was distributed. In Mexico people hid the republic's silver and gold and used paper money which sprang up during its civil war of 1910-1917. In 1918 the peso was reduced to half its 19th century size and the fineness continued at .800.

In 1920 the first of the .720 fine pesos were minted. By 1947 the peso coin was reduced to .500 fine. In 1950 a peso of only .300 fine silver was struck. And from 1957 to 1967 the peso was just .100 fine — a sad grey coin containing just 10% silver. In the 1950s Mexico produced 5 peso coins of .720 fineness. In 1968 and 1972 some 25 peso coins of .720 fineness were circulated. With each step down in silver quality the newer coins circulated and the older coins of better silver were tucked away — Gresham's

Law again and again. Each time a weaker silver ‘bad’ coin was introduced the ‘good’ coins with a higher alloy of silver would disappear into sacks, socks, sugar bowls and melting cauldrons.

Canada began the 20th century in the tradition of the British Empire with sterling silver coins — .925 fine. In 1920 the silver was reduced to a .800 fine alloy which continued into the 1960s. The effect of Gresham’s Law there was much like the USA. In 1968 its coins were made with nickel — a metal extensively mined in Canada.

Gresham’s Law occurred many times in the 1800s USA

Historically, the most notable Gresham’s Law incidents in the 1800s were the Hard Times era of the 1830s, several gold rushes and the Civil War of 1860-1865.

The Hard Times era of the 1830s caused fear and economic hardship. In mid-1836, banks and other businesses who received public money were required to accept only silver and gold coins to pay for public lands. That caused a panic, and the public began hoarding coins. This caused banks and merchants to have financial troubles and some many failed and a depression began. Both inflation both Gresham’s Law tore at the country for years. Lacking minor coins, many merchants struck private tokens and many banks and states printed paper money, most of it not backed by silver or gold. These copper tokens and banknotes — scarce, popular collector’s items today — sent silver and gold into hiding.

One version of Gresham’s law occurred when there was an inequality in value between silver and gold coins in a country with a bimetallic standard — as was the USA. This happened in the U.S. when large gold discoveries lowered gold’s value: the lode mining in North Carolina starting in 1825, then discoveries in Georgia in 1829 and California in 1848, topped off by gold rushes in Russia in the 1840s and in Australia in 1851. This put great amounts of gold into the world market.

Gold became so common that the ratio between silver and gold fell from 16-to-1 to 15.45-to-1 in early 1852. At that point, silver coins could not be kept in circulation in the U.S. while the lesser-valued gold circulated. Exports of silver by profiteers exceeded the total volume of coinage of the previous 30 years. All that remained of silver coins were worn Spanish-American *reales* and underweight dimes and half dimes.

Paper money also created Gresham’s Law troubles in certain communities for a period of time. Throughout much of the 1800s, almost any organization could print its own money. Many states, cities and banks did so. At one point there were more than 30,000 varieties of currency in circulation. Some banknotes were redeemable in gold and silver, others were backed by bonds issued by regional governments. Those determined by citizens to be ‘bad’ were circulated as the ‘hard’ money to disappear into countless hiding places. Such coin-banknote relationships occurred throughout the world.

Sweden’s copper coins spark Gresham’s Law trouble in the early 1700s

Government ignorance of Gresham’s Law in Sweden caused serious troubles in the early 1700s with its Gortz *dalers*. Finance minister Baron Gortz introduced a completely copper coinage system with an arbitrary and false ratio to the nation’s silver pieces. King Charles XII was later talked into accepting Gortz’s monetary foolishness. To maintain the prestige of throne and country, the king insisted that the coppers, which came to be known as ‘calamity coinage,’ should not bear the ruler’s name or the national coat-of-arms.

To insure acceptance of the new coins they were made legal tender equal in value to a silver *daler*. When rumors spread that copper *dalers* were given in place of silver coins deposited in the banks, faith in the government collapsed. Copper coins lost value and the silver pieces were hoarded.

The government then made it a crime to discriminate between silver and copper coins. This halted all trade except bartering. When the hoarded silver coins were ordered confiscated, people began exporting of large quantities of silver pieces. The government by now was obviously up to its legislature in problems. In 1719, after 325,168,000 cheap copper *dalers* had been minted and the national debt had risen to more than \$50,000,000, the government adopted another plan to put strength back into its treasury. It offered to exchange the copper pieces for the silver ones at the ratio of 16-to-1.

As if this was not ruinous enough for the thrifty souls who had accumulated quantities of the copper pieces, the silver-less government could only pay for the coins with paper. Both the paper money and copper coins soon became worthless and the nation fell into acute poverty for several years. All this because a few men thought they could halt the normal human reaction defined in Gresham's Law.

Medieval and ancient coins suffered repeatedly from the effects of Gresham's Law

Looking back 1000 years at solutions to short-term money problems reveals a lot about Gresham's Law at work. In the medieval period there was always the temptation to use less silver in coins that were in short supply. Debasement in this way meant a mint could produce more of them for the same materials cost. The 'bad' weaker silver coins would restore the supply for a while, but shortages would reappear as Gresham's Law caused the better coins to be hidden away. This repeated mixing copper into silver coins explains why the English penny in year 1000 was a silver coin and by the 1700s had become a copper one.

Looking back at ancient Rome we see only the faintest understanding of this axiom was ever demonstrated. Ancient literature is filled with tales of coin debasement. When the frauds of economically ignorant emperors caused coin debasement and other currency manipulations, the delicate balance of the Roman metallic system was upset. Citizens pulled all gold and silver out of circulation and used the bronze coins. They traded away their precious metal coins with foreigners and used the debased billon coins locally as the empire collapsed around them. Too late, the Roman leaders realized that bimetallic monetary system was causing gold and silver to vanish via hoarding, smelting or export. No wonder so few emperors died in bed.

The Greek philosopher Aristophanes, writing during a money emergency in Athens just before 404 BC, nailed Gresham's Law: "In our republic bad citizens are preferred to good, just as bad money circulated while good money disappears." In Aristophanes' play *The Frog*, one character speaks about coins and Gresham's Law in poetic form, linking bad coins with bad politicians:

"For your old and standard pieces, valued and approved and tried.
Here among the Grecian nations, and in all the world beside,
Recognized in every realm for trusty stamp and pure assay,
Are rejected and abandoned for the trash of yesterday;
For a vile, adulterate issue, drossy, counterfeit and base,
Which the traffic of the city passes current in their place!"

Even with Aristophanes warning about the problem, the Greeks often failed to grasp and correct for Gresham's Law. The Black Sea Borysthenes decree of ancient Greece hints at how Gresham's Law might be involved in decisions about which coins to spend and which to keep: "The import and export

of any kind of coined gold and silver is permitted. Anyone who wishes to sell or buy coined gold or silver [can] in the meeting place of the assembly. It is permitted to buy or sell gold and on no account at a higher value or greater price, and other gold and silver coinage of all kinds at any rate satisfactory to both the parties concerned.

The Code of Hammurabi in Babylonia allowed both silver and grain to be used as money, but it prescribed that certain payments were to be paid in silver while others were done with grain. There are some cultures in which Gresham's Law did not apply, because of strong traditions or a lack of exporting kept the native exchange in use. Thus the heavy iron or brass primitive currencies of Africa remained in circulation in secluded areas even when their value was lower than currency from outside of those areas. In these cases, a lack of transportation to move barter media out of the areas played a part.

The Western civilization's first coins are credited to 7th century BC Lydia. These earliest coins struck from electrum, a natural mix of about 70% gold and 30% silver. But hoards of these coins found at Ephesus were made of false electrum made with as little as 30% gold. The Lydians and Greeks had learned Egyptian metallurgy techniques, and used that to overvalue coins by using less gold and exploit coins. Once the subjects of these kingdoms got wind of the 'bad' coins — Gresham's law had its first numismatic incident. People were also learning for the first time that the face value of a coin would be always different from the coin's value as metal.

Those mysterious and exciting buried hoards uncover more than just wonderful coins. They often leave clues about national insecurity. A large hoard of silver or gold coins of high quality and all dated within a few years of each other could be evidence of a period effected by Gresham's Law. Such hoards of "good" coins that have been driven out of circulation by "bad" coins point toward the monetary policies at the time the coins disappeared.

Many a coinless society recognized the problem Gresham's Law posed and developed methods of overcoming it. In primitive barter systems thousands of years ago, hoarding of the best items and trading off the least desirable material was a widespread practice. Actual coins are not needed for Gresham's Law to work. When tribes used cattle as currency, farmers tried to use the shabbier bovines for payment and keep the healthiest animals.

Demonstrations of Gresham's Law can be found in any period of history and in any country in the world. Its results were inevitable whenever there is a prolonged choice allowed between two monetary units of differing values. Given the circumstances, it is almost as difficult to revoke as the law of gravity.

The limitations of Gresham's Law

Gresham's Law always had its limits. First of all, Gresham's Law could only occur in individual countries. It only applied to what economists call the internal value of money — coins' in use inside a single political entity. When something looks like Gresham's Law internationally it may be a lack of monetary balance between countries. So it did not apply to multi-national monetary activities — where an opposite rule about money prevailed: Throughout history competition and efficiency made sure that strong, 'good' coins have driven bad money out of international commerce. The ancients had Greek tetradrachmas, Persian darics, Macedonian staters and Roman denarius — all good, reliable coins. The florins, ducats and sequins of the Italian city-states were among the best coins of the late medieval period.

After the discovery and conquest of the new world by Spain the silver *reales* and gold *escudos* created from silver and gold mined from the Americas were the most desired coins on the planet for centuries. Britain's pound sterling in the 19th century and the U.S. dollar and trade dollar in the 20th century become the dominant coins because they were trustworthy. "Consistency, stability and high quality have been the attributes of great currencies that have won the competition for use as international money," noted Robert Mundell in 1998.

A depression in a nation could also have caused its coins to lose value in relation to another country's more stable economy. Thousands of silver coins were smuggled out of silver-rich Mexico in the 20th century for smelting because other nations valued the metal more. It was the forces of an external value of metal and money, not Gresham's Law at work. Just an international occurrence in which the value of metals differed between countries.

The threat of disappearing silver coins in the U.S. in the early 1960s was the workings of industrial supply and demand on silver bullion value, not Gresham's Law. It was the future possibility of a higher value of silver compared to the face value of silver that motivated the hoarding. The cause in this type of situation can be tested with a question: If Gresham's Law was the cause, what alternate currency drove the silver coins out of circulation? The answer in this case is that no 'bad' currency or coin was involved — until 1965. It was just the potential bullion value of silver that caused silver to vanish before that year.

Sir Thomas Gresham and others who understood the monetary law named after him

The problem of bad coins driving the good out of circulation in England was documented by Sir Thomas Gresham. He was born in 1519 and was the founder of the Royal Exchange in London and served as the royal agent for King Edward VI, managing the English debt abroad. Later, under Queen Elizabeth I, he explained how the debased English coinage under Henry VIII caused gold to be driven out of Great Britain. "Good and bad coin cannot circulate together." It was this explanation that came to be known as Gresham's Law, first appearing in the 1858 book by H.D. Macleod called *The Elements of Political Economy*.

Copernicus in 1517 wrote *De aestimatione monetarum* (*On the Value of Coin*) and *Modus cudendi monetarum* (*The Way to Strike Coin*). He submitted these reports to the government of his native Poland in 1522. In 1528 Copernicus wrote a longer paper, *Monetae cudendae ratio* (*On the Minting of Coin*). In that document he noted the principle that "bad money drives out the good", which was ahead of Gresham by a few years. This phenomenon had been noted 150 years earlier by Nicole Oresme but Copernicus is believed to have discovered it independently. This principle is still known in much of central and Eastern Europe as the Copernicus-Gresham Law.

Copernicus explained that money is a measure of common market value. If its value is artificially set low by a nation, that money causes the more valuable coins to be removed from circulation. He also explained that sound, full-weight coins and degraded coins will not circulate together. All the good coins get hoarded, melted down or exported and the degraded coins circulate. A government could keep adjusting the legal values of two coins with fluctuating market values, but that is just too complex a task and would be abandoned.

Bishop Nicholas Oresme (1320-1382) had expertise in finance as well as theology, mathematics and astronomy. His *De Moneta* manuscript dealt with the rights of citizens to use currency and the evils of debasement and devaluation. Ironically, he did his writing during the rule of King John the Good

(1350-1364) who devalued English coinage 86 times. Oresme helped make the concept of Gresham's Law known in the 14th century.

And now we live with 100% fiat money

Today the world lives with 100% fiat money — and we are not talking about Italian cars. Fiat refers to coins and banknotes with no value in themselves — the U.S. situation since 1970 when the cumbersome clad 40% silver Kennedy half dollar coins ended. The last whimper of silver was in that coin, produced from 1965 to 1970 with its outer layer of .800 fine silver over an inner core of .209 fine silver. Today no currency in the world today offers gold or silver to redeem it and no circulating coins contain silver. And, of course, NCLT— Non-circulating legal tender — a by-product of Gresham's Law does not really apply. These items, of course, are not real coins but medals of bullion minted in nations around the world as 'collectables.' That someone could spend them for 1/10 their silver value does not make them true coins. Too often mints are simply pandering to uninformed non-collectors.

Sources:

- Angell, The Story of Money 1929
- CoinStar company
- Economic Perspectives Magazine
- Einzig, Primitive Money
- Ellison, "Baron Gortz & his Dalers" *Numismatist* 1897
- Mundell, Robert, *Uses and Abuses of Gresham's Law in the History of Money* 1998
- The Silver Institute website
- Perry, *Principles of Political Economy* 1891
- Price, A Note on Gresham's Law *Numismatist* May 1960
- U.S. Federal Reserve System website
- U.S. Treasury website
- Willem, *The U.S. Trade Dollar*, 1960